Material and Methods

This study was conducted on hypertensive individuals between 30 – 50 years of age, who were either attending the hypertension clinic or were admitted in the wards of M.L.B. Medical College, Hospital, Jhansi. Both male and female subjects were included in the study. Normotensive individuals of similar age group were treated as control subjects.

Detailed history was taken from all the patients of hypertension, to know the duration of symptoms, year of diagnosis, family history of hypertension, any complications and treatment undertaken previously.

**Personal History** including Name, Age / Sex, religion, education, occupation, smoker or non-smoker, drinking habits, socio-economic status, marital status and number of kids were enquired.

**Family History** of diabetes and hypertension were enquired for, in maternal and paternal side.

**Present History**

Detection of hypertension, age at which detected, what has been the course, risk factors like smoking, tobacco chewing, obesity, alcoholism, emotional stress, high fat diet, operation (renal diseases), diabetes mellitus, pregnancy induced hypertension, pregnancy associated hypertension.
Drug history

Intake of steroids, oral contraceptives, vaso pressors, treatment taken or not, dietary precaution, drug dosage and duration, whether continued the treatment or interrupted. Whether a regular coffee drinker or not and if yes then the approximate amount per day.

**Dietary History** : - Vegetarian or non-vegetarian. Approximate consumption of fat per week.

**General Examination** was done to look for any particular facies, buffalo hump, weight, height, body mass index, pulse rate, arterial wall, radio femoral delay, other peripheral pulses, BP (systolic/diastolic) – 2 readings after 15 minutes of rest in sitting position, oedema (dependant / periorbital), xanthelasma, tendon xanthoma, arcus senilis, temperature, icterus, clubbing, pallor oedema (dependent / periorbital), cyanosis, hydration and lymphadenopathy.

**Criteria of Hypertension** : - All patients between the age group 30 to 50 years with the BP of > 139 / 89 mm Hg were included in the study. They were categorized according to JNC VII as:

<table>
<thead>
<tr>
<th>Systolic BP</th>
<th>Diastolic BP</th>
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<tbody>
<tr>
<td>Stage 1 hypertension</td>
<td>140 – 159</td>
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<tr>
<td>Stage 2 hypertension</td>
<td>≥ 160</td>
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</tbody>
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**Criteria of Controls** : - Normotensive individuals with a blood pressure of less than 120 mm Hg systolic and less than 80 mm Hg diastolic, of same age and sex were considered as controls.

**Measurement of Blood Pressure** :- Patient was initially rested for 15 minutes, then he was made to be seated comfortably with the forearm supported such that the arm was positioned at the level of the heart. Initially the BP was measured in both the arms and the one with higher BP was taken for records. A mercury sphygmomanometer was used to
measure the BP. While recording the BP international standards of BP measurement (Cuff corresponding to approximately 2/3rd of arm length, lower edge of Cuff approximately 2.5 cms above the anticubital fossa and the bladder long enough to encircle at least 80% of the arm), taking special care that the brachial artery is properly occluded. The pressure of bladder was raised approximately 20 mm of Hg above the systolic level as was indicated by disappearance of radial pulse because patients might have an auscultatory gap related to increased arterial stiffness. The Cuff was deflated at a rate of 2 – 4 mm of Hg per second. Disappearance of the sound (phase 5) was taken as the end point as against muffling (phase 4).

**Effect of Caffeine on Blood pressure**: - 50 gms of coffee powder was made into 20 standard cups of Coffee. Patients and controls were asked to drink the coffee and blood pressure was recorded after 30 and 60 minutes.

To study the effect of stress on blood pressure a standardized and reproducible stress procedure like Stroop color-word test and mental arithmatic test were used.

**Stroop color card test**: - It is a laboratory method of inducing stress. On a card the words red, blue, green and yellow are printed in different colours ; no word is printed in the color it indicates, but an equal number of times in each of the other three colors. Thus, each word presents the name of one color. Hence, a word stimulus and a color stimulus are presented simultaneously. The color-word test involves interference between color – naming and word reading. The test card contains a hundred words. After 5 minutes of Stroops procedure mental arithmetic test was done.
Mental arithmetic test: This task was given verbally to the subjects and they were asked to keep on subtracting 7 from 500. After 3 minutes of arithmatic mental stress i.e., after 8 minutes of total stress, BP was recorded. This method was adopted both for subjects and controls.

To study the effect of cold pressor test, subjects and controls were asked to dip their left hand in ice cold water (0 - 4° C) upto wrist, for 1 minute. Thereafter BP was recorded in the same arm.

To study the effect of physical activity on blood pressure: - Blood pressure was measured after 15 minutes of rest. Then the subjects and controls were asked to climb 4 flights of stairs containing 44 stairs within 45 seconds. Thereafter the blood pressure was recorded. Lastly the results were summarized and compared with control group.
Name: 
Religion: 
Smoker / Non-smoker: 
Alcoholic / Non-alcoholic: 
Socio-economic status: 
Marital status: 
Children: 
Family History of Hypertension: 
   (1). Paternal side: 
   (2). Maternal side: 
Present history: 
   1. Detection of hypertension: 
      Age at which detected: 
   2. Risk Factors: 
      (a). Smoking 
      (b). Tobacco chewing 
      (c). Obesity 
      (d). Alcoholism 
      (e). Emotional stress 
      (f). High fat diet 
      (g). Operation if any (Renal iseases) 
      (h). Diabetes mellitus 
      (i). Pregnancy induced Hypertension 
      (j). Pregnancy associated HTN 
3. History of drug intake: 
   Steroids 
   Oral contraceptives 
   Vaso-pressors 
   Others 
4. Treatment taken or not: 
If Yes, kind of treatment.

General Examination:

Weight: 
Height: 
BMI: 

Pulse:
1. Rate 
2. Rhythm
3. Character 
4. Volume
5. Radio femoral delay 
6. Arterial wall

Pallor: 
Oedema: 
Icterus: 
Xanthalasma: 
Cyanosis: 
Tendon Xanthoma: 
Clubbing: 
Arcus senilis: 

1. BP in sitting position after 15 minutes of rest
   1st Reading: 
   2nd Reading: 

2. BP after ingestion of 1 cup of strong coffee (after 30 minutes and 60 minutes)

3. BP after 15 minutes of rest
   1st Reading: 
   2nd Reading: 

4. BP after mental stress by Stroop card test (for 5 minutes) and by mental arithmatic test (after 3 minutes)
5. BP after 15 minutes of rest
   1\textsuperscript{st} Reading :  
   2\textsuperscript{nd} Reading :

6. BP after climbing 4 flights of stairs within 45 seconds

7. BP after 15 minutes of rest
   1\textsuperscript{st} Reading :  
   2\textsuperscript{nd} Reading :

8. BP after immersion of left hand in ice cold water (0 – 4\textdegree{} C) for 1 minute.